

ASSIGNMENT 9

Textbook Assignment: "Basic Actuating Systems," chapter 8, pages 8-1 through 8-23.

- 9-1. What unit transforms hydraulic fluid pressure into mechanical force, which performs work by moving some mechanism?
1. An actuating unit
 2. A cylinder unit
 3. A control unit
 4. A power unit
- 9-2. Naval aircraft use which of the following types of actuating units?
1. Linkage units
 2. Hydraulic motors only
 3. Actuating cylinders only
 4. Hydraulic motors and actuating cylinders
- 9-3. Aircraft actuating cylinders are used when which of the following mechanism movements are required?
1. Bilateral motion
 2. Linear motion only
 3. Reciprocating motion only
 4. Linear or reciprocating motion
- 9-4. What is the most common type of actuating cylinder used on naval aircraft?
1. Balanced
 2. Cushioned
 3. Unbalanced
 4. Dual hydropneumatic
- 9-5. If hydraulic pressure is used to move a single-acting actuating cylinder in only one direction, all EXCEPT which of the following forces may be used to move it in the opposite direction?
1. Gravity
 2. Fluid bypass
 3. Spring tension
 4. Nitrogen pressure
- 9-6. The operation of a single-acting, spring-loaded, piston-type actuating cylinder is normally controlled by what component?
1. A directional control valve
 2. A limiting switch
 3. A priority valve
 4. A sequence valve
- 9-7. In reference to a double-acting, piston-type actuating cylinder, which of the following statements is correct?
1. There are two pressure and two return ports
 2. The cylinder contains two pistons and one rod
 3. Fluid pressure can be applied to either side of the piston
 4. The stroke of the piston rod travels in one direction only
- 9-8. An unbalanced, double-acting, piston-type actuating cylinder uses a directional control valve capable of directing fluid in what total number of ways?
1. One
 2. Two
 3. Three
 4. Four
- 9-9. To prevent internal leakage from one-side of the piston to the other, double-acting, piston-type actuating cylinders are equipped with which of the following items?
1. Backup rings only
 2. Backup rings and O-rings only
 3. Backup rings, O-rings, and metal scrapers only
 4. Backup rings, O-rings, metal scrapers, and felt wipers
- IN ANSWERING QUESTION 9-10, REFER TO FIGURE 8-3 IN THE TEXTBOOK.
- 9-10. When the cylinder is in the down and locked position, the locking ball bearings are held in the locking position by what means?
1. Hydraulic pressure
 2. A ball-lock plunger
 3. Detent springs
 4. A piston shaft
- 9-11. To equalize the displacement of fluid on either side of the piston, a double-action, finger-lock actuator incorporates what component?
1. A piston spring
 2. A balance shaft
 3. An inner cylinder
 4. An integral spring-loaded mechanical lock

- 9-12. The finger-lock actuators used on the landing gear have a down-limit switch mounted on and through the cylinder area for what purpose?
1. To indicate when the landing gear is down and locked
 2. To allow pressure to be released during jacking operations
 3. To allow the pilot to release the down locks during emergencies
 4. To control hydraulic pressure to the emergency pneumatic extension line
- 9-13. During normal extension of a landing gear finger-lock actuator, which of the following forces move(s) the piston over the fingers?
1. The airstream only
 2. Hydraulic pressure only
 3. Hydraulic pressure and spring tension only
 4. Hydraulic pressure, spring tension, and the airstream
- 9-14. In a power-operated flight control system, all the force necessary for deflecting the control surface is supplied by hydraulic pressure and wind force.
1. True
 2. False
- 9-15. A tandem-type, control surface actuating cylinder uses a synchronizing rod for what purpose?
1. To direct pressure to each control surface
 2. To isolate fluid pressure during an emergency
 3. To equalize the flow of fluid into the actuator piston chambers
 4. To allow the pilot to operate either flight control surface independently
- 9-16. Which of the following procedures should you follow when cleaning the piston shaft of an actuating cylinder?
1. Wipe it with engine oil
 2. Wipe it with aliphatic naphtha
 3. Wipe it with Freon, and then with grease
 4. Wipe it with dry-cleaning solvent, and then with hydraulic fluid
- 9-17. In the maintenance of actuating cylinders, what is the most common trouble encountered?
1. External leakage
 2. Internal leakage
 3. Mechanical damage
 4. Electrical damage
- 9-18. Hydraulic pressure is converted into rotary mechanical motion by which of the following components?
1. A hydraulic motor
 2. An actuating cylinder
 3. A power control cylinder
 4. A control surface actuator
- 9-19. Hydraulic motors are commonly used to operate which of the following aircraft equipment?
1. Rudders and stabilizers
 2. Radar and wing flaps
 3. Speed brakes and trim tabs
 4. Landing and arresting gear
- 9-20. What type of a valve directs pressurized fluid to one working port of an actuating cylinder and, at the same time, returns fluid to the reservoir from the other working port?
1. An automatic check valve
 2. A sequence valve
 3. A selector valve
 4. A shuttle valve
- 9-21. Which of the following is NOT a type of selector valve?
1. Slide
 2. Poppet
 3. Shuttle
 4. Solenoid-operated
- 9-22. To relieve pressure created by thermal expansion of the fluid, a system that has a balanced poppet-type selector valve must also incorporate what other type of valve?
1. A one-way check valve
 2. A thermal relief valve
 3. A sequence control valve
 4. A manually operated relief valve

IN ANSWERING QUESTION 9-23, REFER TO FIGURE 8-8 IN THE TEXTBOOK.

- 9-23. The poppets of a poppet-type selector valve are actuated by what means?
1. The solenoid
 2. The poppet spring
 3. The return fluid pressure
 4. The cams on the camshaft
- 9-24. To prevent overrunning, all poppet-type selector valves are provided with what integral device?
1. A stop
 2. A striker plate
 3. An electrical cutoff
 4. A hydraulic limiting switch
- 9-25. When all four of the poppets of a poppet-type selector valve are held firmly seated by the springs and there is no fluid flow, the valve is in what position?
1. The return position
 2. The working position
 3. The neutral position
 4. The pressure position
- 9-26. Malfunctioning selector valves are usually the result of which of the following problems?
1. Improper installation
 2. Damaged parts only
 3. Foreign particles only
 4. Damaged parts and foreign particles
- 9-27. External leakage from a poppet-type selector valve could be caused by which of the following conditions?
1. A damaged O-ring packing on the poppet
 2. A damaged gasket under the sealing plug
 3. A damaged center packing on the camshaft
 4. A damaged bottom gasket on the poppet seat
- 9-28. Currently, what type of selector valve is the most durable and trouble-free?
1. The slide-type
 2. The poppet-type
 3. The shuttle-type
 4. The solenoid-type

IN ANSWERING QUESTION 9-29, REFER TO FIGURE 8-10 IN THE TEXTBOOK.

- 9-29. The O-rings form a seal between the sleeve and the body creating what total number of chambers around the sleeve?
1. Nine
 2. Two
 3. Five
 4. Four
- 9-30. The slide-type selector valve has raised, machined portions that are known by which of the following terms?
1. Stops
 2. Lands
 3. Lobes
 4. Retainers
- 9-31. A slide-type selector valve has three grooves at the end next to the eye. The grooves are known by which of the following terms?
1. Lines
 2. Lands
 3. Rings
 4. Detents
- 9-32. A slide-type selector valve should have a light film of hydraulic fluid applied to the exposed areas of the slide primarily for what purpose?
1. To prevent corrosion
 2. To lubricate the slide
 3. To prevent external leakage
 4. To prevent the entry of foreign matter
- 9-33. A solenoid-operated selector valve is controlled by what means?
1. Electrically
 2. Mechanically
 3. Hydraulically
 4. Pneumatically
- 9-34. A solenoid-operated selector valve directs the flow of fluid to and from the actuator by the use of what component?
1. The plunger
 2. The pilot slide
 3. The selector slide
 4. The lever assembly

- 9-35. A solenoid-operated selector valve controls bleed pressure by the use of what component?
1. The sleeve
 2. The plunger
 3. The solenoid
 4. The position lock
- 9-36. For the proper cleaning, inspection, repair, and testing of selector valves, you should use what series of NAVAIR manuals as a guide?
1. 01 series
 2. 02 series
 3. 03 series
 4. 04 series
- 9-37. When testing a solenoid selector valve, you must bleed all air from the valve before applying pressure for which of the following reasons?
1. To prevent premature operation of the solenoids
 2. To ensure proper lubrication of the parts
 3. To ensure proper seating of the O-rings
 4. To prevent a leak from going undetected
- 9-38. The purpose of a check valve is to allow the fluid to flow in one direction only.
1. True
 2. False
- 9-39. What is indicated by the arrow on the body of an automatic check valve?
1. The direction of restricted flow
 2. The direction of reversed flow
 3. The direction of checked flow
 4. The direction of free flow
- 9-40. A bypass check valve differs from an automatic check valve in which of the following ways?
1. It can be manually closed to completely stop the flow of fluid in both directions
 2. It can be manually opened to allow fluid to flow in both directions
 3. It is automatically opened to allow fluid to flow in both directions
 4. It is automatically opened to allow restricted flow in both directions
- 9-41. What is the most common cause for internal leakage of a check valve?
1. A broken spring in the valve
 2. Foreign matter in the valve
 3. Vibrations in the system
 4. Water in the system
- 9-42. Sequence valves may be operated in which of the following ways?
1. By pressure only
 2. By pressure or mechanically only
 3. By pressure, mechanically, or electrically only
 4. By pressure, mechanically, electrically, or pneumatically
- 9-43. What are the two types of mechanically operated sequence valves?
1. Equal and unequal
 2. Loaded and unloaded
 3. Manual and automatic
 4. Balanced and unbalanced
- 9-44. Trouble associated with a mechanically operated sequence valve is most commonly a result of what problem?
1. Foreign matter
 2. Weak valve springs
 3. Faulty O-ring seals
 4. Improper adjustment
- 9-45. A priority valve is operated by what means?
1. Manually
 2. Electrically
 3. Pneumatically
 4. Automatically
- 9-46. Isolation of the normal system from the emergency hydraulic system is the main function of what valve?
1. The shuttle valve
 2. The control valve
 3. The priority valve
 4. The isolation valve
- 9-47. Excessive heating of a shuttle valve is a good indication of what type of problem?
1. Internal leakage
 2. External leakage
 3. Improper adjustment
 4. Broken mechanical linkage

9-48. An actuating units speed of operation is controlled by what component?

1. A capacitor
2. A restrictor
3. A priority valve
4. A sequence valve

9-49. To retard the action of a hydraulic cylinder by limiting the flow of fluid in both directions, you should use which of the following devices?

1. A timing valve
2. A control valve
3. A one-way restrictor
4. A two-way restrictor

9-50. When it is necessary to lower the normal operating pressure a specified amount, you should use what valve?

1. A flow control valve
2. A two-way check valve
3. A pressure reducing valve
4. A one-way restrictor valve

9-51. An automatic resetting hydraulic fuse is designed to close and shut off the flow of fluid that passes through it when which of the following problems occurs?

1. Excessive volume
2. Excessive pressure
3. Excessive temperature
4. Excessive contamination